CHAPTER XV

THE TEMPERATUKES AND TRANSMISSION OF HEAT IN THE COMBUSTION CHAMBER OF THE OPEN-HEARTH FURNACE.

IN all open-hearth furnaces one observes during working a flame temperature of approximately 1,800° maximum in the combustion chamber and of about 1,700° at the exit ports, and one may well assume that the former signifies the maximum which the furnace chamber is capable of, whilst the latter constitutes the minimum which is absolutely necessary for practical possibility of steel making.

As to the ways and means of the utilisation of the heat in the combustion chamber, and especially as to the extent of this utilisation, there has hitherto been scarcely anything written or uttered. In the following views as to this question let it be at once remarked that these figures are taken as purely personal observations of the writer's and that they were not able to be tested by practical experiments.

The heating of materials on the hearth of an open-hearth furnace is in principle a very simple matter. A hotter flame plays on a cooler object and heats this in consequence of the difference of temperature which is present between the two, whereby the flame itself naturally suffers loss of heat.

The correctness of this fundamental principle will also endorse the introductory data cited, since the highest temperature of the flame amounted to 1,800°, but in consequence of the work done (on the hearth) was cooled down to 1,700°. The work can have been performed in different ways, in that heat can have been given off through direct contact, by conduction or indirectly by radiation; in the combustion chamber both kinds of heat transmission take place. For the flame both are as yet little investigated ; if one, nevertheless, takes the heat as being merely a form of energy, and contents oneself provisionally only in ascertaining the